



**Location:**  
I-83 South Bridge  
Harrisburg, PA

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## PROJECT PROFILE

# EFS Inspection of I-83 Harrisburg South Bridge

### Situation

Pennsylvania Department of Transportation (PennDOT) used Metal Fatigue Solution's Electrochemical Fatigue Sensor (EFS) System as part of HNTB Corporation's (HNTB) inspection contract of the I-83 South Bridge in Harrisburg, Pennsylvania.

Biennial inspections revealed that the ramp girder terminations have developed multiple fatigue cracks. Drill stop holes were installed at the crack tips in July of 2008. The EFS system was used to inspect repair locations where drill stops had been used to arrest fatigue cracks. Also, four additional repaired locations were inspected.

The EFS system was used to determine if the drill stops were effective at arresting crack growth. During the inspection the EFS system was installed and data collected to determine the status of the various locations.

Tests at inspection locations determined:

- Over 50% (13 of 23) implemented repairs appear to not be effective at halting crack growth.

### Results

Under the conditions inspected, the data indicate that thirteen of the twenty-three drill holes are not functioning as crack arrestors. Seven of the drill stop locations had plastic (permanent) deformation occurring or a small crack already initiated and propagating. Six of the locations had precursors to plastic (permanent) deformation, called microplasticity in Table 1, which may cause crack initiation in the future. Ten of the drill holes did not exhibit microplasticity or plasticity.

